

**AZURE SUITE SYLLABUS****Cloud Computing Introduction**

- What is Cloud Computing
- Cloud Characteristics
- Cloud Computing Service Models
- Deployment Models in Cloud Computing
- Advantages and Disadvantages of Cloud Computing
- Cloud Computing Job Roles.
- Cloud Computing Platforms and Certifications.

**Getting Starting with Azure**

- Introduction to Azure
- Why, What and Benefits of Azure
- Azure Hosting Models
- Azure Services
- Subscribing to Microsoft Azure
- Azure Portals
- Azure Key Concepts
- Azure Resource Group
- Installing Microsoft Azure SDK

**Configure and Manage Azure Virtual Networks**

- Overview of Azure Networking
- Virtual Network Benefits
- Understanding Network Resources
- Implement and manage virtual networking
  - Create a VNet using Azure Portal
  - Create a Subnet
  - Configure private and public IP addresses
  - Create Network Interface Card with public, and private IP addresses
  - Create a Virtual Machine
- Setup Network Security Group
  - Create security rules
  - Associate NSG to a subnet or network interface
  - Identify required ports
  - Evaluate effective security rules

- Azure Firewall
- Understanding Azure DNS
  - Configure Azure DNS
  - Public and Private DNS Zones
- Create connectivity between virtual networks
  - Create and configure VNET peering
  - Create and configure VNET to VNET
  - Verify virtual network connectivity
- Monitoring and Troubleshooting Network Connectivity

### **Implement Advanced Virtual Networking**

- Load Balancing
  - Configure external and internal Azure Load balancer
  - Load Balancing Rules
  - Implement front end IP configuration
- Understanding and Creating Availability Set
- Understanding Availability Zones
- Azure Application Gateway
- Azure Traffic Manager
- Integrate on-premises network with Azure virtual network
  - Site-to-Site VPN
  - Express Route Solution
- Monitor and Manage Networking
  - Verify, Manage and Monitor on-premises connectivity;
  - Use network resource monitoring and Network Watcher
  - Manage external networking and virtual network connectivity

### **Azure Storage Service**

- About Storage Service and Account
- Creating a Storage Account
- Working with Blob Storage
  - Types of Blobs (Block, Append, Page)
  - Container and Metadata
  - Soft Copy
  - Azure Storage Explorer
  - Transfer Data using AzCopy

- Programming Blob Storage
- Async Blob Copy
- Import and Export Service
- Implement and Configure CDN
- Configure Custom Domain
- Scale Blob Storage
- Storage Service Encryption
- Manage Access / Securing Storage
  - Create and Manage Shared Access Signature
  - Account SAS vs Service SAS
  - Using Stored Access Policies
  - Regenerating Keys
  - Encrypt Keys using Azure Key Vault integration
  - Programming in C#
- Working with Table Storage
  - Understanding NoSQL Database
  - Creating Table and Entities using Storage Explorer
  - Entities and Properties
  - Table storage vs COSMOS DB Table API
  - Programming Table Storage
- Azure Queues Storage
  - Understanding Async Communication using Queues
  - Comparing Azure Queues and Service Bus Queues
  - Programming Queues
- Azure SMB File Storage
  - Common usage of File Storage
  - Shares, Directory and File
  - Managing Using Azure Portal
  - Programming File Storage
- Azure File Sync
- Configure diagnostics, monitoring and analytics
  - Capturing Metrics Data
  - Analyzing Diagnostic Data
  - Capturing Logs
  - Retention Policies and Logging Levels
  - Analyze Logs
  - Enabling Monitoring

- Enabling Alerts

**Manage resource groups**

- Use Azure policies for resource groups
- Configure resource locks
- Configure resource policies
- Implement and set tagging on resource groups
- Move resources across resource groups
- Remove resource groups

**Managing Azure with Windows PowerShell and Azure CLI.**

- Installing the required modules
- Login to Azure Portal
- Managing Resource Group
- Managing App Service Plans and App Service Web Apps
- Create and Configure a Storage Account
- Managing Storage Accounts using PowerShell
- Azure CLI Introduction and Setup
- Creating Resources
- Listing and Formatting output
- Connect a Web App to SQL Database
- Deleting Resources
- Interactive Mode

**Managing ARM Templates.**

- Understanding Azure Resource Manager (ARM)
- Exporting and Importing ARM templates.
- ARM Resource Providers
- Deploy ARM Templates
  - Using PowerShell
  - Azure CLI
  - Azure Portal
- Incremental and Complete Deployments

**Azure Virtual Machine**

- Introduction
- About Virtual Machine Workloads
- Create a Windows Virtual Machine using Portal / PowerShell / ARM Templates
- Deploy popular application frameworks by using Azure Resource Manager templates
- Virtual Machine Disk
- Convert Unmanaged Disk to Managed Disk
- Generalizing VM and Capture VM Images
- Upload an on-premise VHD to Storage Account and attach to VM as Data Disk
- Working with Disk Snapshot
- VM Disk Types
- VM Sizes in Azure
- Configuring VM Disk Encryption
- Perform configuration management
  - VM Extensions & VM Agents
  - Custom Script Extensions
  - Desired State Configuration (DSC)
  - Access Extension
- Virtual Machine Scale Sets
- Configure VM monitoring, configure alerts, diagnostic and monitoring storage location.

**Managing Data in Azure SQL Database**

- Introduction / Overview of SQL Database.
- Azure SQL Managed Instance
- Comparing SQL Azure Database to Azure / On-Premise SQL Server.
- Creating and Using SQL Server and SQL Database Services.
- Azure SQL Database Tools.
- Migrating on premise database to SQL Azure.
- Dynamic Data Masking
- Transparent Data Encryption
- Planning the Deployment of an Azure SQL Database
- Elastic Pools.
- Dynamic Data Masking
- Configure SQL Database Auditing
- Export and Import of Database using .bacpac
- Manage Business Continuity / Data Recovery

- Backup and Recovery options in SQL Database
- Active GEO-Replication
- Monitoring Azure SQL Database and Alerting

### **Implement and Manage App Services – Web App**

- Introduction
- App Service - Application Types
- Deploy Web Apps
  - Deploying Web App directly from Visual Studio
  - Automate deployment from Dropbox and One Drive
  - Create, configure and deploy packages
  - Implement pre- and post-deployment actions;
- App Service plans;
  - Create App Service Plan
  - Migrate Web Apps between App Service plans;
  - Create a Web App within an App Service plan
- Configuring Web Apps
  - Application Settings Configuration,
  - Database Connection Strings,
  - Configuring Handlers and Virtual Directories,
- Manage App Services
  - Configure a custom domain name
  - Enable SSL for your custom domain
  - Understanding Deployment Slots and Roll back deployments;
  - App Service Protection
  - Manage Roles for an App service
- Configure Web Apps for scale and resilience
  - Horizontal and Vertical Scaling of a Web App
  - Configure auto-scale
  - Change the size of an instance
- Monitoring, Debugging and Diagnosis
  - Retrieve Diagnostics data
  - View Streaming Logs
  - Configure endpoint monitoring
  - Configuring Alerts
  - Configure diagnostics

- Use remote debugging
- Monitor Web App resources
- Azure Traffic Manager to Scale out Globally

### **Implement Azure Functions**

- About Azure Functions.
- Azure Webjobs vs Azure Functions
- Create and Configure an Azure Function
- Create an event processing function
  - Timer Triggered Function
  - Blob Storage Triggered Function
- Implement an Azure-connected functions
  - Adding message to Storage Queue
  - Connecting to SQL Database
- Creating Azure Functions through Visual Studio
- Azure Durable Functions
- Walkthrough: Creating Image Thumbnail

### **Azure App Service - Logic Apps**

- Introduction
- Triggers and Actions
- Creating a Simple Logic App
- Handling array of Items using for-each and condition
- Logic App with Variables
- About Enterprise Application Pack
- Add Custom Function with Azure Function
- Creating Custom Connectors
- Using Custom API App in Logic App
- Azure Functions vs Logic Apps
- Building Logic Apps in Visual Studio.NET

### **App Service - API Apps**

- Introduction
- Creating an API App
- Deploying an API App
- Consuming an API App

- Authentication and Authorization in API App.
- Using API App in Logic App

**API Management Service**

- Overview of API Management
- Components of API Management System.
- API Apps vs API Management.
- Create managed APIs.
- Configure API management policies.
- Protect APIs with rate limits.
- Add caching to improve performance.

**Azure Service Bus**

- Service Bus Basics
- Hosting WCF Service in Azure
- Relayed Messaging
- Service Bus Queues
- Topics and Subscriptions
- Handling Transactions
- Handling Sessions

**Azure Event Grid**

- Introduction
- Event Source and Event Handlers
- Comparing with Service Bus Queues and Topics
- Route storage events to Azure Functions
- Monitor VM changes using Event Grid and Logic Apps

**Azure Event Hub**

- Overview
- Key Architecture Components
- Sample Event Producer and Consumer in C#

**Key Vault**

- Secrets vs Keys
- Accessing Keys and Secrets



- Use cases for Key Vault
- Use Azure Key Vault from a Web Application
- Using Key Vault with ARM Template
- Encrypt and Decrypt BLOBS in Azure Storage

**Redis Caching**

- Caching Overview
- What is Redis Cache
- Creating a Redis Cache
- Developing Redis Cache Client
- Controlling Expiration

**Azure CosmosDB Service**

- What is CosmosDB
- Global Replication and Consistency Levels
- Understanding SQL Model database Schema
- Creating and Saving Documents using Portal
- Programming Schema
- Adding / Editing / Deleting and Reading Documents

**Implement Azure Search within Solution**

- About Search Service,
- Create Search Service,
- Create Index
- Import Data,
- Handle Search Results
- Programming Search in .NET using Azure Search SDK

**Implement Azure Backup**

- Overview of Azure Backup
- Configure VM backup
- Create Recovery Services Vault
- Define and Implement backup policies
- Perform VM restore
- Perform backup operation
- Configure and review backup reports

**Manage Azure Subscriptions**

- Understanding Azure Subscriptions
- Configuring Role Based Access Control
- RBAC using Portal
- RBAC using PowerShell and CLI
- Custom Roles for RBAC
- Managing Subscription Policies
- Locking Resources
- Checking Resources Limits
- Resource Tags

**Managing and Securing Identities using Azure Active Directory**

- Azure AD Introduction
- Azure AD Editions
- Managing Active Directories
- Adding a custom domain name to Azure AD
- Managing Azure AD Users, Groups and Devices
- Adding Partner Users from other organization
- Configure Windows 10 with Azure AD domain join
- Synchronizing On-Premise AD Identities with Azure AD
- Azure AD Connect
- Azure AD User Sign-In Options
  - Password Synchronization
  - Passthrough Authentication
  - Federated SSO
- Multi Factory Authentication
- Conditional Access Policy
- Access Reviews
- Privilege Identity Management
- Integrating SaaS Applications with Azure AD for SSO
  - Add Users and Groups to Application
  - Revoke access to SaaS Applications
- Managed Identities

**Programming Secure Applications using Azure Active Directory**

- Application Types Scenarios
- Multi-Tenant vs Single-Tenant
- Integrating ASP.NET MVC Applications with Azure AD
- Integrating ASP.NET Web API Applications with Azure AD
- Claims Based Authentication
- Role Based Authentication
- Implementing Azure AD B2C Collaboration
- Microsoft Graph API

**Azure Monitoring and Log Analytics Workspace**

- Azure Monitor Overview
- Monitoring Metrics
- Monitoring Logs
- Log Analytic Workspace
- Collect data from a Azure VM / Windows computer
- Azure Activity Logs
- Azure Diagnostics Logs
- Application Insight

**Migrate Servers to Azure**

- Overview of Cloud Migration
- Azure Site Recovery
- Migrating the Virtual Machine
- Migrating the SQL Database
- Failover and Failback Process

**Docker Registry**

- Build Docker Image
- Publish Image to Azure Container Registry
- Use image in Azure Container Instance
- Use Image in Azure App Service

**Microservices and Kubernetes**

- What is Monolithic Application
- What are Microservices

- Kubernetes Architecture
- Azure Kubernetes Service (AKS)
- Creating AKS Cluster and Deploying Application.